

**Report on the
SEDAR 24: Red Snapper Data Evaluation Process Peer Review**

Prepared for:
The Center for Independent Experts

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EXECUTIVE SUMMARY

The Southeast Data, Assessment and Review (SEDAR) has an excellent track record in running effective, open and transparent processes that result in high quality scientific information as an input to management decision-making. The products of those processes have been the subject of peer review for many years, but the SEDAR processes themselves, while generally highly regarded, have not. The subject of SEDAR 24, South Atlantic Red Snapper (*Lutjanus campechanus*), is the focus of high public interest and processes leading to management decisions are therefore under scrutiny. There is therefore reason to provide peer review of the SEDAR 24 process (rather than just products) to build public confidence that the products of the process might be the best available. The Center for Independent Experts (CIE) was asked to appoint an independent reviewer for the SEDAR 24 Data Evaluation Workshop (DEW), the first step in the SEDAR 24 process.

Guidance to the CIE reviewer was limited, with a request to focus review on whether the SEDAR 24 Data Evaluation Workshop process was “*open and transparent*” and whether “*discussions were based on sound scientific principles*”. To provide a fuller framework for the review, the CIE reviewer has adopted a more formal structure, comprising six “principles”, based on developing Guidelines for National Standard 2 of the Magnuson-Stevens Fisheries Management and Conservation Act. The review of process has commented on SEDAR 24 DEW in light of these 6 Principles: Relevance; Inclusiveness; Objectivity; Transparency and openness; Timeliness; and Verification and validation. General comments on administration have also been made.

SEDAR 24 DEW administration was excellent with good coordination, communication, and support of processes to deliver on the clear terms of reference. The SEDAR Coordinator and staff should be congratulated for their endeavors and management of the process.

Overall, SEDAR 24 DEW has met the standards set by the developing Guidelines on National Standard 2. Consideration of each Principle provides high confidence that the SEDAR 24 DEW products can be used with confidence in subsequent SEDAR 24 stages.

A small number of examples have been noted where aspects of various Principles may be less robust than the generally very high standard set at SEDAR 24 DEW but it should be remembered that these examples have been sought out as part of the peer review remit to observe and critique.

A limited number of recommendations have been made with respect to future process. These recommendations relate to specific terms of reference for making research recommendations and to improving Workgroup processes where local knowledge is sought. That the recommendations are made does not imply criticism of the current processes.

BACKGROUND

South Atlantic Red Snapper

South Atlantic Red Snapper (*Lutjanus campechanus*) is an important species for commercial and recreational fisheries extending from North Carolina to eastern Florida. Red Snapper is both targeted and by-caught in other groundfish fisheries. Recreational catches of Red Snapper are greater than commercial catches. The predominant catching method for both sectors is handlining. Catches in both sectors comprise landings and discards; given size limits in place since 1983 (12") and 1992 (20"), discards comprise a significant portion of catches, both historically and currently.

Data are available from Federal and State programs. Recent and current landings are generally well monitored but historic landings, especially recreational, and discards are less well known. Discard mortality is also not well known. There are no fishery independent indices available for stock monitoring.

The most recent benchmark assessment of South Atlantic Red Snapper was carried out between June 2007 and January 2008 (SEDAR 15 SAR 1; February 2008, Revised March 2009), using a statistical catch-at-age model. The stock was determined to be overfished (since the 1960s) and subject to severe overfishing. Following the benchmark assessment all targeted fishing for Red snapper was prohibited and plans were put in place for extensive area closures from late 2010, in order to effect rebuilding. The extensive area closures, whilst protecting Red Snapper, would have severe impacts on commercial and recreational fisheries, affecting access to and catches of a wide range of stocks, and hence generating intense public interest.

The 2010 Red Snapper assessment was initially planned as an update only but the high interest from the public, as well as from recreational and commercial fishing sectors, has resulted in upgrading the assessment to a full benchmark assessment.

SEDAR Process

Benchmark assessments are carried out under the Southeast Data, Assessment and Review (SEDAR) process (see Appendix 4). The SEDAR process generally comprises three workshops: i) Data Evaluation, ii) Stock Assessment, and iii) Review. Typically, the Center for Independent Experts (CIE) appoints reviewers to form a panel in the Review Workshop (step iii). Recently, however, CIE Reviewers have also been involved in SEDAR Assessment (SEDAR 18) and Data Evaluation (SEDAR 22) Workshops. Due to high public concern over Red Snapper status and management, a CIE Reviewer was appointed to SEDAR 24 to observe and critique the Data Evaluation Workshop process (see below).

Peer Review

The National Marine Fisheries Service (NMFS) is in the process of amending Guidelines for National Standard 2 (*Conservation and management measures shall be based upon the best scientific information available*) of the Magnuson-Stevens Fisheries Management and

Conservation Act. NMFS is proposing additional guidelines under this rule for scientific peer review to ensure the reliability, credibility, and integrity of the scientific information used in fishery conservation and management measures (Dept of Commerce 2009). The intended effect of these revisions is to ensure that scientific information, including its collection and analysis, has been validated through appropriate peer review, is transparent, and is used appropriately by NMFS, Regional Fisheries Management Councils, and their Scientific and Statistical Committees, in the conservation and management of marine fisheries.

In developing the Guidelines for National Standard 2, NMFS has considered international best practice guidance and existing national advice and guidance. Specifically, NMFS has i) incorporated the National Research Council (2004) recommended principles for evaluating best available scientific information: Relevance, inclusiveness, objectivity, transparency, timeliness, verification, validation, and peer review of fishery management information; and ii) ensured that additional rules on peer review requirements adopt many of the requirements of the Office of Management and Budget (OMB) Bulletin on Peer Review (OMB 2004), whilst retaining flexibility to use existing peer review processes established within SSCs, or for Councils to establish additional independent review processes.

For the purposes of this review, the developing guidance on information quality is especially relevant and is used to as a basis for evaluation of the SEDAR 24 Data Evaluation Workshop process. Relevant sections of the developing Guidance (Dept of Commerce 2009) include:

...Scientific information that is used to inform decision making should include an evaluation of its uncertainty and identify gaps in the information.

...Scientific information includes, but is not limited to, factual input, data, models, analyses, technical information, or scientific assessments. Scientific information can be conveyed through data compiled directly from surveys or sampling programs, or through models that are mathematical representations of reality constructed with primary data. The complexity of the model should not be the defining characteristic of its value; the data requirements and assumptions associated with a model should be commensurate with the resolution and accuracy of the available primary data.

*...**Principles** for evaluating best scientific information must be based on relevance, inclusiveness, objectivity, transparency and openness, timeliness, verification and validation, and peer review, as appropriate.*

- i) **Relevance** - Scientific information should be pertinent to the current questions or issues under consideration and should be representative of the fishery being managed.*
- ii) **Inclusiveness** - Three aspects of inclusiveness should be considered when developing and evaluating best scientific information: (A) The relevant range of scientific disciplines should be consulted to encompass the scope of potential impacts of the management decision. (B) Alternative points of view should be acknowledged and addressed openly when there is a diversity of scientific thought. (C) Relevant local and traditional knowledge should be acknowledged.*
- iii) **Objectivity** - Scientific information should use standards for objectivity that prevent non-scientific considerations from impacting on its scientific integrity. The objectivity standards should ensure that information is accurate, reliable, and unbiased, and that information products are presented in an accurate, clear, complete, and balanced manner.*
- iv) **Transparency and openness** - (A) Subject to the Magnuson-Stevens Act confidentiality requirements, the public should have access to each stage in the development of scientific information, from data collection, to analytical modelling, to decision making. (B) Scientific information products should describe data collection methods, report sources of uncertainty or statistical error, and acknowledge other data limitations. Such products should explain any decisions to exclude data from analysis. Scientific products*

should identify major assumptions and uncertainties of analytical models. Finally, such products should openly acknowledge gaps in scientific information.

- v) Timeliness - *Sufficient time should be allotted to analyze recently acquired data to ensure its reliability and that it has been audited and subjected to appropriate review before it is used to inform management decisions.*
- vi) Verification and validation - *Methods used to produce scientific information should be verified and validated to the extent possible. (A) Verification means that the data and procedures used to produce the scientific information are documented in sufficient detail to allow reproduction of the analysis by others with an acceptable degree of precision. (B) Validation refers to the testing of analytical methods to ensure that they perform as intended. Validation should include whether the analytical method has been programmed correctly in the computer software, the precision of the estimates is adequate, model estimates are unbiased, and the estimates are robust to model assumptions. Models should be tested using simulated data from a population with known properties to evaluate how well the models estimate those characteristics.*
- vii) Peer review - *Peer review is a process used to ensure that the quality and credibility of scientific information and scientific methods meet the standards of the scientific and technical community. Peer review helps ensure objectivity, reliability, and integrity of scientific information. The peer review process is an organized method that uses peer scientists with appropriate and relevant expertise to evaluate scientific information.*

REVIEWER'S ROLE IN THE REVIEW ACTIVITIES

The role of the reviewer is set out in the CIE Statement of Work, Attachment A, attached here in Appendix 2. Attachment A makes clear that the reviewer is not a panelist at the SEDAR 24 Data Evaluation Workshop but is rather tasked to “observe and critique the data evaluation process”. This is different to previous SEDAR Data Evaluation Workshop CIE Reviewer remits. For example, the role of the CIE Reviewer at the SEDAR 22 Data Evaluation Workshop was to “participate in the Data Workshop and to provide impartial and independent reviews on the process and products of data compilation ...”

Although general guidance as to the review requirements is provided in attachment A (e.g., “*The reviewer will consider whether the process is open and transparent and whether discussions are based on sound scientific principles*”) and in the Terms of Reference given in Annex 2, it is noted that “Guidelines for conducting a peer review of the data evaluation process have not been developed”.

Given this lack of defined guidance on how to conduct the required peer review of the data evaluation process, background preparation for the peer review included a consideration of general peer review requirements in the US and elsewhere and the final adoption of the Principles discussed in the Background section, above:

- i) Relevance
- ii) Inclusiveness
- iii) Objectivity
- iv) Transparency and openness
- v) Timeliness
- vi) Verification and validation

To the extent possible, this review of the Red Snapper Data Evaluation Workshop process attempts to evaluate the four Workgroups and overall Workshop with respect to Principles i-vi laid out above and with consideration of the Workshop Terms of reference (see Appendix 3). The review has involved auditing of pre-workshop teleconferences, direct observation of the Workgroups and Workshop in Charleston, SC, from 24-28 June 2010, reading of background documents supplied in advance *via* a dedicated ftp site (including papers submitted by sector representatives and stakeholder submitted questions), consideration of the SEDAR 15 Assessment Report (as a means of considering relevance), and multiple direct discussions with the Workshop Chair and (some, not all) Workgroup Leaders, appointed representatives and observers.

For sake of completeness, and despite formalized acknowledgment through CIE preparatory processes, the reviewer (and author of this document) meets the requirements for expertise and balance, conflict of interest, and independence laid out in the developing Guidance on National Standard 2 (Dept of Commerce 2009):

- i) Expertise and balance - Peer reviewers must be selected based on scientific expertise and experience relevant to the disciplines of subject matter to be reviewed, including a balance in perspectives.
- ii) Conflict of interest - Peer reviewers must not have any real or perceived conflicts of interest with the scientific information, subject matter, or work product under review, or any aspect of the statement of work for the peer review. For purposes of this section, a conflict of interest is any financial or other interest which conflicts with the service of the individual on a review panel because it: (A) Could significantly impair the reviewer's objectivity; or (B) Could create an unfair competitive advantage for a person or organization. (C) Conflicts of interest include, but are not limited to, the personal financial interests and investments, employer affiliations, and consulting arrangements, grants, or contracts of the individual and of others with whom the individual has substantial common financial interests, if these interests are relevant to the functions to be performed. Potential reviewers must be screened for conflicts of interest in accordance with the procedures set forth in the NOAA Policy on Conflicts of Interest for Peer Review subject to OMB's Peer Review Bulletin.
- iii) Independence - Peer reviewers must not have participated in the development of the work product or scientific information under review. For peer review of some work products or scientific information, a greater degree of independence may be necessary to assure credibility of the peer review process; reviewers should not be employed by the Council or entity that produced or utilizes the product for management decisions.

SUMMARY OF FINDINGS FOR THE DATA EVALUATION WORKSHOP

General Comment

Comments are made below with respect to the six criteria identified above. The intention here is to give an over-arching impression of the SEDAR 24 Data Evaluation Workshop process.

The process was highly organized and well administered. Early notices outlining process, participants, ToR and arrangements were made and materials were loaded on to and made available through the SEDAR 24 ftp site. Two "Topical Workgroups" were arranged in advance

to consider topics of major relevance to the assessment – discard mortality and historic recreational data. Teleconferences were held to discuss overall Data Evaluation Workshop organization and issues as well as for the Topical Workgroups. All teleconferences were recorded and the audio files were made quickly available on the ftp site. Invitations to submit materials and comments were made and responses were quickly loaded to the ftp site. The impression overall is that steps were taken to give maximum effect to achieving relevance, objectivity, timeliness, openness and transparency, and inclusiveness.

In Charleston, the Workshop was opened in a businesslike but friendly and welcoming manner. Administrative details were quickly dealt with and the programs for the Workgroups were quickly affirmed and the groups set to work. All present, whether appointed participants or observers, were given the opportunity to comment from the outset. Throughout the Workshop, opportunity was given and taken for comment and discussion. Ample opportunity for both scientific and less formal input was provided. Stakeholder participation was notably high both in numbers and contributions to discussion. Throughout, participants were respectful and polite.

Specified Workshop Goals were set out in the Agenda (see Appendix 2, Annex 3). The goals were approached through plenary sessions and the use of four dedicated Workgroups (Life History, Indices, Recreational and Commercial) and continuing efforts of the two Topical Workgroups.

Throughout the Workshop, there was repeated coordination of Workgroup efforts, with regular feedback to the Workshop, clear opportunities for discussion, regular invitations for public comment, and clear consensus adoption of recommendations on a session to session basis. Tasks were clearly specified and at no times did the Workshop plenary sessions end with any doubt as to progress made and work to be done by each Workgroup.

The ftp site was well maintained throughout the meeting with regular contributions by the Workgroups. Workgroup rapporteurs posted notes to the relevant directories and copies of presentations were quickly loaded. Despite a public holiday starting as the Workshop ended, updated files and final session files were all loaded immediately after the holiday period, and a post-Workshop task list was e-mailed. Within days, working documents on the task list were finalized and submitted, made available on the ftp site, and notified by e-mail.

As Workgroups worked concurrently, it was not possible to observe all. Given the key issues in the assessment and for management, peer review observation was concentrated initially on the Commercial and then Recreational and Discard Mortality Workgroups. I was able only twice to audit the Indices Workgroup and only very briefly the Life History Workgroup. Each Workgroup had its own character and mode of working, determined by the participants and Leaders, specificity of ToR, interest and participation of stakeholders, and workload/time available. All Workgroups were generally able to fulfill requirements set out in the ToR; the workshop was therefore able generally to meet its specified goals (noting that some can only be met post workshop).

On day 1 about 50 people participated in the Workshop and Workgroups. Each day, the list, though not constant, was of a similar order. The process can accurately be described as both

extensive and intensive. Such processes are not inexpensive. The cost of allowing for effective public participation and observation, especially for a fishery/stock spanning multiple State and Federal jurisdictions and subject to multi-sector interests, is large. Many of those costs are direct, estimable costs but there are additionally many less tangible transaction and opportunity costs that need to be taken in to account. Costs naturally drive concern that the process was effective in meeting public concerns and providing confidence in the final products.

In the final analysis, the large majority of the Data Evaluation Workshop products are “data-driven”, with little or no direct modification by stakeholder involvement. Hopefully, however, the explanations of data inclusion, exclusion and treatment will be strengthened through stakeholder involvement and greater acceptance of the products will result. Although data-driven products have not been directly influenced by stakeholder input, I am in no doubt that not only was the process spurred by public interest (motivating the change from a planned Update assessment to a Benchmark one) but that within the Benchmark process the high degree of public interest, extending to strong participation, has stimulated a particularly rigorous and comprehensive approach. This has resulted in real change in the products that will go forward to the stock assessment process compared to those in SEDAR 15, which produced the last assessment of this stock.

Relevance

Scientific information should be pertinent to the current questions or issues under consideration and should be representative of the fishery being managed.

Terms of Reference (ToR) for the SEDAR 24 Data Evaluation Workshop are attached at Appendix 3. The twelve ToR are comprehensive and explicit and provided a sound basis upon which the Workshop and its Workgroups could organise work. The ToR cover the expected bases for data inputs to stock assessment and hence to providing fisheries management advice (stock structure, life-history information, catch (landings and discards) data, age and length information, fishery and potentially fishery independent indices, etc), etc. The ToR clearly specify actions of particular relevance to the South Atlantic Red Snapper assessment and management that require Workgroup attention (e.g. use of pre-MRFSS data in developing recreational catch history, provision of fishery specific discard mortality rates, consideration of selectivity patterns in hook and line fisheries, recommendations of future research, and development of the “data book” (i.e., inputs to the Red Snapper stock assessment)).

The Workshop process was carefully planned and coordinated such that Workgroup activities were focused on delivery of nearly all ToR and on providing relevant inputs to stock assessment and management. Primarily, the process was structured to provide stock assessment inputs, and advice on their use, as well as ancillary information of potential management value (e.g., maps of fishery harvest and effort). The stock assessment process (SEDAR step ii) will provide estimates of quantities relevant to management decision making – a necessary (though not sufficient) condition for relevance and credibility of the stock assessment is that the data inputs and advice on their use are also relevant (also objective, verified and validly produced).

In the preceding paragraph, it is stated that “Workgroup activities were focused on delivery of nearly all ToR”. The term “nearly” is used because one key (arguably critical) area explicitly

requiring attention in the ToR (ToR 9: “*address the degree to which domed shape selectivity should be applied to hook and line fisheries*”) was not effectively attended to. This is noted also under the discussion on various criteria, below.

While all major Workshop products are relevant directly to stock assessment and management, the many research recommendations made by Workgroups are arguably not well focused on the requests made in the ToR, in particular those described in ToR 10 which calls for “*specific guidance on sampling intensity...and appropriate strata and coverage*.” No other ToR calls for research recommendations, though it is normal practice to make them. The four Workgroups made a total of 29 research recommendations, most of which were general in nature and few of which directly addressed the requirements in ToR 10. No attempt was made to cost or prioritize the recommendations made, nor explicitly to relate them to assessment, management or policy needs. As such, the majority of research recommendations are not strictly relevant in terms of the criterion being addressed here.

Inclusiveness

Three aspects of inclusiveness should be considered when developing and evaluating best scientific information: (A) The relevant range of scientific disciplines should be consulted to encompass the scope of potential impacts of the management decision. (B) Alternative points of view should be acknowledged and addressed openly when there is a diversity of scientific thought. (C) Relevant local and traditional knowledge should be acknowledged.

The SEDAR 24 Data Evaluation Workshop was attended by a wide range of appointed participants, representatives and observers. Appointed participants included biologists and analysts from the State and Federal agencies, with wide ranging expertise, as well as a wide range of commercial and recreational fishers with knowledge and experience of a range of fisheries. Council and other representatives, and Council and Agency management staff, also participated. A wide range of Observers was also present with a clear invitation to make comment in the Workshop and in Workgroups. Generally, the large number of participants and observers with scientific and fishery expertise provided a strong foundation for developing and evaluating best scientific information to feed in to subsequent stock assessment and management processes.

With respect to (A), each Workgroup appeared to function well with good scientific input to explain data being used (or not) and to analyse data appropriately where necessary. The role of the Data Evaluation Workshop is to develop objective inputs to the stock assessment process, itself intended to provide a (neutral) risk assessment for consideration in a wider risk management context. As such, it is perhaps not appropriate to require that the Data Evaluation Workshop participants should include the full *relevant range of scientific disciplines ... to encompass the scope of potential impacts of the management decision*, at least not in the sense of final fishery management decisions. Rather, it is more important that the participants should include the range of disciplines sufficient and necessary to ensure that decisions are made that lead to the best scientific information being available to feed in to the forthcoming stock assessment. All Workgroups comprised such a range, especially when enhanced by observers and representatives. Specific examples of additional input include a key role played by an observer in the Recreational Workgroup and the Analytical Team Representative in a number of

Workgroups. However, even at the data evaluation and workbook preparation stage, it is important to attend to errors and uncertainties in data in a way that will flow appropriately to stock assessment and management processes; as such, even whilst striving to provide objective data inputs, some consideration of management consequences becomes inevitable. These issues are dealt with under considerations of objectivity and transparency and openness.

With respect to (B), all Workgroups observed, and the Workshop, included robust (but polite) debate. I did not see any obvious instances of alternative scientific views being marginalised or ignored and most scientific decisions were readily made. This impression was supported by discussion with some Workgroup Leaders.

With respect to (C), local knowledge was well acknowledged and generally influenced data decisions where appropriate. An exception to this was in the development of historic recreational catch where the Workgroup (and subsequently the Workshop) was able to agree only “grudgingly” (as “ever so slightly” preferred) to accept a method using the ratio of MRFSS-estimated recreational landings to commercial landings to backfill historic charter and headboat landings. Recreational fishers generally considered that the resulting series did not accord with experience, especially the estimated high peak in the early 1970s, and made strong arguments in this respect. The ratio approach was adopted nevertheless given scientific arguments as to its being the best available.

I have some difficulty with the decisions made on this issue. The application of the ratio method is intuitively appealing and can be data driven. As a means of developing a best series it therefore has merit. However, I am concerned on a number of counts and wonder if “local knowledge” might have been better used in this instance. Given that the assessment will fit the provided landings history very tightly, it is important to provide a sensible series, or set of alternate series for sensitivity testing, especially with respect to their impact on quantities of interest to management. It might, though, be best to provide a roughly right series, capturing the quantum of historic landings and possible periodic variations, rather than providing the assessment with detailed pseudo-year-to-year landings, mirroring the commercial landings. Providing a wrongly detailed series will potentially provide false information for the assessment to interpret. The ratio method could certainly provide a basis for providing estimates of the quantum of recreational landings averaged over periods of time, without relying on the precise year-to-year correspondence with commercial landings patterns. Only if there is high confidence that the two fisheries are highly correlated year-to-year would it be reasonable to apply the method as recommended by SEDAR 24. Arguments made by fishers during the Recreational Workgroup suggested good reasons to use the ratio method with caution and perhaps not at all for detailed year-to-year estimates.

In addition, it is notable that the year-to-year ratios (as seen, for example, in SEDAR 24 WD 11, Fig 13) are highly variable and the overall average is driven by a number of particularly high annual MRFSS estimates. If the ratio method is to be applied, it is important to determine the validity of these high-influence annual estimates. It is of some concern that as early as day 2 of the Workshop, SEFMC staff noted that there is not the time, or resources, to investigate the individual high points. In my view this is unfortunate and investigation of the validity of those points is essential prior to deciding how to treat them.

However, this is touching more on the review of products rather than process, as tasked. My impression overall is that local knowledge was well listened to and had influence. On the specific subject of recreational landings history my view is that concerns articulately made by fishers were not so well attended to.

It is not possible to comment on aspect (C) of the inclusiveness criterion without also considering how discard mortality (ToR 5) was approached.

It is clear that the estimated or assumed discard mortality rate could have an influence on the extent of spatial closures being contemplated to underpin Atlantic Red Snapper stock rebuilding. Simply, the higher the discard mortality, the greater would be the required area closures to achieve any given rebuild target (with time and probability components). The discard mortality rates used in SEDAR 15 were 90% for commercial hook and line and 42% for recreational hook and line. An active Topical Workgroup dealt with this issue and provided a useful review paper to the Workshop. Essentially, the problem was resolved in to two issues: i) how does mortality vary with depth of capture, and ii) what is the distribution of depth of capture for each fishery. Early in SEDAR 24, the Topical Workgroup was convened to discuss the issues. Discussion was lively with good scientific input but primarily extensive opportunity for fishers to provide input on fishery patterns by region and through time. The Topical Workgroup was able to reach consensus on how to approach issue (i) based on the review paper prepared in advance, leaving issue (ii) to be dealt with by the Commercial and Recreational Workgroups.

The Commercial Workgroup was able to use observer data on discard mortality from tagging programs and quickly developed a distribution of fishing depths for integration with the agreed mortality at depth function. The Workgroup was therefore able very quickly to derive a credible estimate of discard mortality for the commercial hook and line fishery. The estimate of 49% was agreed by consensus despite being very different to that used in SEDAR 15. Interestingly, the tagging observer-derived depth distribution and derived discard mortality figure was reasonably consistent with the observations by commercial fishers during the previous, extensive discussions. It would have been more efficient to start with the data analysis and then to proceed to stakeholder discussion.

Deriving a distribution of fishing depth for recreational fisheries was rather more challenging but the Recreational workgroup did have data available for the task that were not available at the time of SEDAR 15 (especially from more recent Florida at-sea headboat surveys). Depth distributions integrated with the agreed mortality at depth function yielded estimates of 41% for charter and headboats and 39% for private boats – consistent with the “guesstimate” of 40% used in SEDAR 15. Development of the estimates required considerable scientific collaboration during the meeting and much stakeholder discussion. As for the commercial estimate, it is notable that had the analyses been available at the outset, extensive stakeholder discussion could have been reduced.

Generally, my strong sense is that local knowledge was extensively provided but not well structured or recorded to permit a clear “analysis” of the information content. Simple chairing and recording techniques could have been employed to make better use of local knowledge and

to both provide greater potential for its uptake and engender greater belief by stakeholders that they were truly listened to. For example, even using a whiteboard or flip chart to keep a clear set of issues for discussion, instead of letting discussions wander off course and often dissolve in to multiple strands (I recorded up to 5 concurrent discussions on multiple occasions in at least three separate Workgroups), would have been useful. On an issue such as historic recreational landings, structuring of information by region would have been helpful, as would the creation of clear information recording means – perhaps something as simple as a Gantt Chart prepared during discussions to summarise inputs. For the initial stakeholder discussions on depth of fishing, a whiteboard or flip chart with simple maps on which to record contributions (region, fishery – stated depths) would have helped make the discussion more efficient. Perhaps most importantly, for both examples, if analyses had been available in advance, much of the local knowledge contributions could also have been more efficiently made – this, however, is a matter of timeliness and perhaps inter-Agency coordination.

Objectivity

Scientific information should use standards for objectivity that prevent non-scientific considerations from impacting on its scientific integrity. The objectivity standards should ensure that information is accurate, reliable, and unbiased, and that information products are presented in an accurate, clear, complete, and balanced manner.

On the one hand it is important that where scientific information is credible, clearly valid and well verified, that information should hold firm against less credible information or claims. However, as intended through the criterion on transparency and use of local knowledge, and through the criterion on verification and validation, sometimes “scientific” information needs to be tempered or even treated with caution. An important aspect in this regard is scientific information needs to be well presented and explained, including its shortcomings, associated uncertainties, etc. These issues are dealt with by the criterion on transparency and openness.

I am not aware of clear “standards for objectivity” and somewhat paradoxically need to revert to a subjective analysis.

My overall impression at SEDAR 24 was of an honest attempt at objectivity while encouraging non-scientific knowledge to be presented and potentially influence decisions if appropriate. As seen during the Workshop and Workgroups, information was presented clearly and discussions suggest that results will be described accurately and in a balanced manner. However, as this review is being written at the same time as the Workshop report, that judgment will need to be made later in light of the final text.

I have only two issues of possible non-objectivity. The first has already been alluded to above. Some of the MRFSS annual estimates are very high and how those annual estimates might be used depends on an objective and thorough appraisal of their validity. In my view, a prior notice that this will not be done, citing time and resource constraints, is not sufficiently objective. If it matters, or might matter, time and resources should be made available. The second issue of concern relates to the use of the agreed (by consensus) function to describe discard mortality at depth. My understanding is that the study underlying the function took multiple factors in to account, including hidden mortality after release. Early in discussion on this topic, even as

agreeing use of the function, the issue was raised and discussed. On the final day, after the Workgroups had derived discard mortality rates for use in the assessment, discussion properly turned to uncertainty in these estimates and formulating advice on sensitivity testing during the stock assessment (but also, of course, potentially in developing advice on area closures). The issue of hidden mortality was again raised with a suggestion that sensitivity testing should therefore include very high mortality rates. Despite local knowledge being provided on behaviour of fish at release and on fish caught with (survived) injuries, suggestions (by scientists) included doubling the estimate as a sensitivity test (i.e. effectively to say all fish caught commercially and then released die – 49% doubled equals 98%) and using the upper 95th confidence interval of the estimate. Other views were expressed, especially noting that in the Gulf of Mexico the estimate was increased by 50% as a sensitivity test, but the decision, made by apparent consensus, to adopt the upper 95% confidence limit was made in great haste, with no numbers presented. My general sense in this discussion, though overtly about developing appropriate sensitivity runs, was that discussion was not entirely objective and could have reached alternative conclusions if time had been available. Indeed, without seeing the consequences (numbers) of the decision reached I find it difficult to understand the decision-making process on this issue. The issue is potentially one of objectivity but also of timeliness. Again, as this report is being written concurrently with the Workshop report, I can only report subjectively on this issue (objectivity) in the absence of final explanations as to decisions made.

Transparency and openness

(A) Subject to the Magnuson-Stevens Act confidentiality requirements, the public should have access to each stage in the development of scientific information, from data collection, to analytical modelling, to decision making. (B) Scientific information products should describe data collection methods, report sources of uncertainty or statistical error, and acknowledge other data limitations. Such products should explain any decisions to exclude data from analysis. Scientific products should identify major assumptions and uncertainties of analytical models. Finally, such products should openly acknowledge gaps in scientific information.

With respect to (A), the SEDAR 24 process observed in Charleston was open not just to appointed participants but to the public and stakeholders as observers. The process was open prior to the Workshop as evidenced by public comments submitted and posted on the ftp site. During the Workshop, regular calls for public comment were made and all materials were freely available.

The only instance I am aware of where data confidentiality requirements created a need for circumspection was in the Commercial Workgroup, dealing with ToR 8 (“*Provide maps of fishery and effort harvest*”). That Workgroup was fully aware of confidentiality requirements and discussed them fully before developing rough maps as requested. The rough maps, produced in spreadsheets, were exemplary only and the Workshop agreed that higher quality maps should be produced as final product, though retaining the same data aggregations for confidentiality reasons. I did not observe similar discussions in the recreational Workgroup and can see no indication of any in the rapporteur’s notes.

Overall, from discussions with participants, materials presented prior to and during the SEDAR 24 Data Evaluation Workshop, I am confident that the openness and transparency criterion (A) is satisfied.

With respect to (B) I am less comfortable that the criterion (“*Scientific information products should describe...*”) is or will be fully satisfied but would defer judgment until the Workshop report (the major Workshop “product”) is available¹. I am confident that the background documents (reference materials and working documents), agreed tasks (being worked through at the time of writing), observed discussions, and working materials posted on the ftp site generally provide good expectations that the Workshop report, or cited relevant materials, will fully describe data collection methods, data limitations, analytical assumptions, and statistical methods employed. Reference to previous Data Evaluation reports, including SEDAR 15 SAR 1, also provides comfort that the SEDAR 24 report will have similar and sufficient detail. Since the Workshop I have monitored activity on the ftp site and it is clear that progress is being made, but at the time of writing there are no draft report sections to scrutinize – all are being worked on by Workgroups without posting on the ftp site.

My single area of discomfort with respect to satisfying criterion (B) relates generally to reporting uncertainty. I fully expect that models used to generate, for example, indices, will allow reporting of standard errors and other statistical measures of uncertainty. From discussions during the Workgroups, however, I am not convinced that sufficient time was taken to discuss and explore uncertainty generally and therefore am not confident that the report will carefully and explicitly convey uncertainties in data or derived series to the Assessment Workshop. This matters in that decisions will need to be made during the stock assessment as to data weighting and sensitivity testing.

I reiterate my comment at footnote 1 that my judgment on this is constrained. My discomfort is driven largely by consideration of discussions on recreating historical recreational landings, discard mortality, and selectivity. These issues are discussed in other sections but for completeness further comment is appropriate. The inferred historic recreational landings series is highly uncertain – I am sure the Workgroup text will reflect this but am not aware of any discussion as to how to portray the uncertainty or advise the Assessment Workshop on sensitivity testing. Discard mortality estimation for the commercial catch appears more certain than for the recreational. I am sure both Workgroups will report on assumptions and uncertainties relating to the depth distribution analyses but as expressed elsewhere am uncomfortable at the discussion relating to sensitivity testing of the final estimates due to factors associated with the applied mortality at depth function. With respect to domed selectivity, no discussion took place and I am unclear what may or may not be conveyed to the Assessment Workshop. Given the potential importance of admitting domed versus flat-topped selectivity, I consider this lack of advice to be a shortcoming.

¹ The CIE Peer Review report is due to be submitted before the SEDAR 24 Data Evaluation Workshop report is due to be finalised. The submission deadline for the CIE Review report is 10th June but the SEDAR coordinator asked that this be brought forward if possible to provide greater likelihood that the report might be included as a component of the SEDAR 24 Data Evaluation Workshop report (due to be completed on 18th June) – by agreement with the reviewer, the new deadline is 8th June. This makes judgment of a number of criteria difficult as the Workshop set up tasks to be completed after the meeting took place. Principal amongst these tasks is preparation of text that will/should contain explanations and descriptions of data treatments and analyses, final calculations, etc.

Timeliness

Sufficient time should be allotted to analyze recently acquired data to ensure its reliability and that it has been audited and subjected to appropriate review before it is used to inform management decisions.

SEDAR 24 was well ordered and well run and had substantial lead-in time during which Topical Workgroups were active and conference calls were held. Yet and nevertheless, many data were only available or analysed during the Workshop. Already it has been noted that analyses on depth distributions of fisheries were undertaken during the workshop, and on deriving the recreational historic landings. The Commercial and especially the Recreational Workgroups ran extensive analyses during the workshop. The Life History and Indices Workgroups also actively analysed data during the Workshop.

The work of the Indices and Life History Workgroups apparently progressed smoothly with data being available and analytical decisions being discussed and made without argument. Discussions with one of these Workgroup Leaders gave good confidence as to process and progress. Certainly, both of these workgroups fulfilled their ToR and provided recommendations on all pertinent issues.

The Workshop did not properly address ToR 9, which asked that it address the degree to which domed selectivity should be applied in hook and line fisheries. I did not see all Workgroup sessions and may have therefore missed relevant discussion but searching through rapporteur notes I can only find reference to a Working Document to be provided for the Assessment Workshop through the Commercial Workgroup. That Workgroup discussed some text provided by a commercial fisher and made suggestions on information that might be added but it is unclear what status this will be afforded in the final Workshop report or what advice it will provide to the Assessment Workshop. The Recreational Workgroup notes simply say that this is an issue primarily for the Assessment Workshop. There was no discussion on these issues during the Workshop plenary sessions. Speaking to various participants I understand the issue is effectively being left to the Assessment Workshop. I am surprised that the issue did not receive more attention and am unsure if this is solely because of a data/information deficit or also due to available time; in this respect, for example, it is hard to see how the Recreational Workgroup could have dealt effectively with the issue in the time available. Given the importance of the issue, a yet-to-be-seen Working Document does not seem appropriately timely in the overall SEDAR 24 process, especially as it is unlikely that so much relevant expertise will be available for the next step in the process.

As noted above under the objectivity criterion, I have concerns that at least one decision – relating to sensitivity testing of the estimated discard mortality rates – was made seemingly in haste. This was due at least in part to the issues being dealt with only during the Workshop. For an issue of such perceived importance, this is not wholly satisfactory.

Verification and validation

Methods used to produce scientific information should be verified and validated to the extent possible. (A) Verification means that the data and procedures used to produce the scientific information are

documented in sufficient detail to allow reproduction of the analysis by others with an acceptable degree of precision. (B) Validation refers to the testing of analytical methods to ensure that they perform as intended. Validation should include whether the analytical method has been programmed correctly in the computer software, the precision of the estimates is adequate, model estimates are unbiased, and the estimates are robust to model assumptions. Models should be tested using simulated data from a population with known properties to evaluate how well the models estimate those characteristics.

Relevant comments on (A) are related to those on the (B) component of the criterion on transparency and openness. Generally, I am confident from observed processes and documentation, including previous Data Evaluation Workshop reports, that sufficient information will be provided to allow independent verification of analyses. The ftp site already contains some worksheets of relevance to allow close scrutiny. Most analyses, however, are not on the ftp site and could be posted. Given the requirements for data availability and the need for analyses to be verifiable, it would be sensible to make all analyses available, including data sets, code (e.g. for running GLMs), and spreadsheets. Many analyses and data manipulations were undertaken during the Workshop using spreadsheets; this provides substantial opportunity for errors and it would be good to see all such analyses posted to allow close scrutiny.

Generally, for the Data Evaluation Workshop there is no need to move to validation (B) techniques such as simulation testing – data treatments are manipulations or statistical model fitting using standard software packages (with validated code) or perhaps spreadsheets. With respect to spreadsheets, the last comment of the preceding paragraph also applies with respect to validation.

CONCLUSIONS AND RECOMMENDATIONS

SEDAR has an excellent track record in running effective, open and transparent processes that result in high quality scientific information as an input to management decision-making. The products of those processes have been the subject of peer review for many years, but the processes themselves, while generally highly regarded, have not been the focus of such review. The subject of SEDAR 24, South Atlantic Red Snapper, is currently the focus of high public interest and processes leading to management decisions are naturally the matter of close scrutiny. From the first steps of SEDAR 24 (Data Evaluation Workshop), therefore, there is good reason to ensure robust processes and to provide peer review of the process (rather than products) to build public confidence that the products of the process might be the best available.

Guidance to the peer reviewer, appointed by the Center for Independent Experts (CIE), was limited, with a request to focus review on whether the SEDAR 24 Data Evaluation Workshop (DEW) process was open and transparent and whether discussions were based on sound scientific principles. To provide a fuller framework, the reviewer has adopted a more formal structure, comprising six principles, based on developing guidelines for National Standard 2 of the Magnuson-Stevens Fisheries Management and Conservation Act. The review of process has attempted to comment on SEDAR 24 DEW in light of these 6 Principles: Relevance; Inclusiveness; Objectivity; Transparency and openness; Timeliness; and Verification and validation. General comments on administration have also been made.

Overall administration was excellent with good coordination, communication, and support of processes to deliver on the clear terms of reference. The SEDAR Coordinator and staff should be congratulated for their endeavors and management of the process.

Relevance

The DEW process was highly relevant, with Terms of Reference (ToR) clearly aimed at producing outputs that will feed in to the next stage of stock assessment. The DEW and its Workgroups were organized to deliver on all ToR and have been largely successful in that quest. One important ToR aspect (ToR 9: “*address the degree to which domed selectivity should be applied to hook and line fisheries*”) was not effectively attended to. This is unfortunate given the importance of the issue, especially as the DEW was arguably better placed to provide advice on the matter than the Assessment Workshop that will follow.

The only DEW products arguably lacking in relevance to the ToR were the many high level and general research recommendations made by Workgroups. It is **recommended** that a clear ToR be established to set the conditions for such recommendations, which should be made with explicit explanation as to how they will contribute to improving knowledge, status estimation or management.

Inclusiveness

This criterion was considered with respect to three attributes, relating to breadth and appropriateness of scientific disciplines; how well different scientific views are acknowledged and addressed; and whether relevant local and traditional knowledge was acknowledged. It is notable that the developing Guideline on National Standard 2 only requires that local knowledge be acknowledged whereas higher standards are placed on the need for scientific breadth and views being addressed. Nevertheless, for the purpose of this review, equal weight has been placed on all of these attributes.

The DEW process included a wide range of relevant scientific disciplines and all debate was polite and open with good opportunity for scientific views to be acknowledged and addressed.

With respect to local knowledge, the DEW process provided ample opportunity for input that was acknowledged. Local knowledge was also addressed and was able generally to influence decisions where appropriate. In the main report, some examples are given of how the provision and extraction of local knowledge was not efficient and simple suggestions are made as to how this could be improved in the Workgroup context. It is **recommended** that for issues where local knowledge has potential influence, more formal methods be used for capturing information in a structured way. Such approaches will provide greater opportunity for local knowledge to be incorporated in decision-making and will also give greater confidence that local knowledge has been fully acknowledged, addressed, and, where appropriate, used.

Objectivity

Generally, DEW discussions and decisions were objective. Two examples are given where objectivity might be compromised by i) failure to fully explore the validity of individual data points or ii) hastily decided upon sensitivity testing bounds without adequate, informed discussion.

The DEW and its Workgroups made a very large number of decisions, leading to development of a wide range of products and outputs. Despite these two examples of potential lack of objectivity, the overall objectivity of the DEW process is not in doubt and products from the DEW can be used with confidence.

Transparency and openness

Public access to the DEW process was encouraged and fully accommodated at all stages. Appointed participants with diverse backgrounds, many representing fishing interests, as well as public observers, were welcomed at the DEW and in Workgroups. Public comment was regularly solicited.

Scientific methods and data were openly discussed and should be well described in the DEW report (unavailable at the time of review finalization). While statistical errors will be reported, it is less clear that uncertainty generally has been well discussed or that clear advice on dealing with uncertainty in stock assessment and management will flow from the DEW. Three issue areas where uncertainty is large and potentially important in management decision-making have been highlighted but it is acknowledged that at the time of writing this review, the DEW report has yet to be finalized and judgment is therefore constrained.

Timeliness

As noted above, the SEDAR 24 organization and administration has been excellent. Timeliness of the processes has been good with provision for pre-DEW work and clear scheduling for Workgroups to meet ToR during DEW. Two issue areas have been highlighted as possibly suffering from a lack of timely consideration. These have already been alluded to in examples under other Principles so should perhaps not be “double counted” here. It is worth noting, however, that the issue of delivery of ToR rests not just with the DEW *per se* but also in the Workgroups and how they are run. The DEW kept regular check on Workgroup progress and tasks but ultimately delivery was in the hands of Workgroups. All workgroups were busy but not all were entirely efficient. It is **recommended** that consideration be given to ensuring future Workgroups have a realistic spread of work and that coordination takes place to ensure relevant personnel are available across Workgroups at key times. Further, in line with the recommendation under Inclusiveness, above, it is **recommended**, especially where local knowledge is being sought, that Workgroups adopt more formal schedules and methods to ensure efficient discussion.

Verification and Validation

As this review is to be delivered in advance of the DEW report, it is not possible categorically to comment on documentation and verification potential. However, based on previous SEDAR

DEW reports and on documentation during SDEDAR 24 DEW, verification should not be problematic. Validation is likely not a major issue for DEW with most analyses being relatively straightforward or using standard (validated) software. However, many of the analyses leading to DEW products were undertaken immediately prior to, during, or even after DEW using spreadsheets. Only some of those spreadsheets have been available on the SEDAR ftp site and it is **recommended** that (within data confidentiality constraints) all spreadsheets used for analysis be available on the ftp site for scrutiny and validation. This recommendation extends also to posting of relevant code used for fitting models (e.g., fitting of indices).

APPENDIX 1

BIBLIOGRAPHY

Prior to the Workshop, extensive materials were provided *via* a file transfer protocol (ftp) site. The materials are too numerous to catalogue here but comprised in excess of 134 files containing audio files from pre-workshop conference calls, historic and working papers, additional references suggested by participants, submitted questions and answers. During the Data Evaluation Workshop, additional reference materials, rapporteur notes, working documents, presentations and public comment were added to the repository available *via* ftp.

Additional References

- Department of Commerce (USA) (2009) Magnuson-Stevens Act Provisions; National Standard 2—Scientific Information. (Proposed Rule FR_121109 to revise the Guidelines for National Standard 2 on Best Scientific Information Available). *Federal Register*, 74(237): 65724 - 65731.
- SEDAR 15 Stock Assessment Report 1 (SAR 1) South Atlantic Red Snapper
- National Research Council (2004) (2004) Improving the Use of the "Best Scientific Information Available" Standard in Fisheries Management Committee on Defining the Best Scientific Information Available for Fisheries Management
(http://www.nap.edu/catalog.php?record_id=11045)
- US Office of Management and Budget (2004) Final Information Quality Bulletin for Peer Review
(<http://www.google.co.nz/search?client=opera&rls=en&q=office+of+management+and+budget+2004+per+review+bulletin&sourceid=opera&ie=utf-8&oe=utf-8>)

APPENDIX 2

Attachment A: Statement of Work for Dr. Kevin Stokes

External Independent Peer Review by the Center for Independent Experts

SEDAR 24 Red Snapper Data Evaluation Process Peer Review

Scope of Work and CIE Process: The National Marine Fisheries Service's (NMFS) Office of Science and Technology coordinates and manages a contract providing external expertise through the Center for Independent Experts (CIE) to conduct independent peer reviews of NMFS scientific projects. The Statement of Work (SoW) described herein was established by the NMFS Project Contact and Contracting Officer's Technical Representative (COTR), and reviewed by CIE for compliance with their policy for providing independent expertise that can provide impartial and independent peer review without conflicts of interest. CIE reviewers are selected by the CIE Steering Committee and CIE Coordination Team to conduct the independent peer review of NMFS science in compliance the predetermined Terms of Reference (ToRs) of the peer review. Each CIE reviewer is contracted to deliver an independent peer review report to be approved by the CIE Steering Committee and the report is to be formatted with content requirements as specified in **Annex 1**. This SoW describes the work tasks and deliverables of the CIE reviewer for conducting an independent peer review of the following NMFS project. Further information on the CIE process can be obtained from www.ciereviews.com.

Project Description: SEDAR 24 will be a benchmark assessment of the status of the US South Atlantic red snapper stock conducted by the Southeast Fisheries Science Center (SEFSC) of the National Marine Fisheries Service (NMFS) (agency). The assessment will be conducted for the South Atlantic Fishery Management Council (SAFMC), which has responsibility for management of the South Atlantic snapper/grouper complex fishery, of which red snapper is a member. The Southeast Data, Assessment and Review (SEDAR) process will coordinate the three components of the assessment, those being data evaluation, assessment model development, and peer review.

The proposed involvement of a CIE-appointed expert will be with the data evaluation component. This component will involve a panel composed of agency scientists and data providers; scientists, biologists, and data managers of state resource management agencies; commercial and recreational fishery representatives; and members of the SAFMC science and statistics committee. Assessment of this stock is an approved item of the SEDAR Steering Committee assessment schedule. The red snapper is an important component of the Atlantic snapper/grouper complex of demersal species and contributes to commercial and recreational fisheries across its range. The most recent assessment of Atlantic red snapper was the benchmark assessment completed via SEDAR in 2008.

This SoW provides the work tasks and Terms of Reference (ToRs) for the CIE peer review of the SEDAR 24 Red Snapper Data Workshop. The ToRs are attached in **Annex 2**, and the tentative agenda of the Data Workshop is attached in **Annex 3**.

Requirements for CIE Reviewers: One CIE reviewer shall conduct an impartial and independent peer review in accordance with the SoW and ToRs herein. The CIE reviewer shall have expertise, working knowledge and recent experience in stock assessment, statistics, fisheries science, and marine biology sufficient to complete the primary task of reviewing the evaluation of data available for this assessment during the workshop. The CIE reviewer shall have the necessary expertise to complete the peer review in accordance with the annexed Terms of Reference. The CIE reviewer's duties shall not exceed a maximum of 16 days to complete all work tasks of the peer review described herein.

Location of Peer Review: The CIE reviewer shall conduct an independent peer review during the Data Workshop scheduled in Charleston, South Carolina during 24-28 May 2010, and during two or more workgroup conference calls.

Statement of Tasks: The CIE reviewer shall complete the following tasks in accordance with the SoW and Schedule of Milestones and Deliverables herein.

Prior to the Peer Review: Upon completion of the CIE reviewer selection by the CIE Steering Committee, the CIE shall provide the CIE reviewer information (full name, title, affiliation, country, address, email) to the COTR, who forwards this information to the NMFS Project Contact no later the date specified in the Schedule of Milestones and Deliverables. The CIE is responsible for providing the SoW and ToRs to the CIE reviewer. The NMFS Project Contact is responsible for providing the CIE reviewer with the background documents, reports, foreign national security clearance, and other information concerning pertinent meeting arrangements. The NMFS Project Contact is also responsible for providing the Chair a copy of the SoW in advance of the panel review meeting. Any changes to the SoW or ToRs must be made through the COTR prior to the commencement of the peer review.

Foreign National Security Clearance: When CIE reviewers participate during a panel review meeting at a government facility, the NMFS Project Contact is responsible for obtaining the Foreign National Security Clearance approval for CIE reviewers who are non-US citizens. For this reason, the CIE reviewers shall provide requested information (e.g., first and last name, contact information, gender, birth date, passport number, country of passport, travel dates, country of citizenship, country of current residence, and home country) to the NMFS Project Contact for the purpose of their security clearance, and this information shall be submitted at least 30 days before the peer review in accordance with the NOAA Deemed Export Technology Control Program NAO 207-12 regulations available at the Deemed Exports NAO website: <http://deemedexports.noaa.gov/sponsor.html>).

Pre-review Background Documents: Two weeks before the peer review, the NMFS Project Contact will send (by electronic mail or make available at an FTP site) to the CIE reviewer the necessary background information and reports for the peer review. In the case where the documents need to be mailed, the NMFS Project Contact will consult with the CIE Lead Coordinator on where to send documents. CIE reviewer is responsible only for the pre-review documents that are delivered to the reviewer in accordance to the SoW scheduled deadlines specified herein. The CIE reviewer shall read all documents in preparation for the peer review.

Data Workshop: The CIE reviewer shall conduct the independent peer review in accordance with the SoW and ToRs, and shall not serve in any other role unless specified herein. **Modifications to the SoW and ToRs can not be made during the peer review, and any SoW or ToRs modifications prior to the peer review shall be approved by the COTR and CIE Lead Coordinator.** Each CIE reviewer shall actively participate in a professional and respectful manner as an observer to the Data workshop, and the reviewer's peer review tasks shall be focused on the ToRs as specified herein. The NMFS Project Contact is responsible for any facility arrangements (e.g., conference room for the Data Workshop or teleconference arrangements). The NMFS Project Contact is responsible for ensuring that the Chair understands the contractual role of the CIE reviewer as specified herein. The CIE Lead Coordinator can contact the Project Contact to confirm any peer review arrangements, including the meeting facility arrangements.

CIE Peer Reviewer's Role: The reviewer will not be a Data Workshop panelist, but will work independently to observe and critique the data evaluation process. The reviewer will become familiar with the Workshop Terms of Reference, reference materials, and working group products. He or she will attend workgroup conference calls or webinars and the data workshop, observe plenary and workgroup session deliberations, and evaluate the process by which the panel receives and evaluates data made available to them. The reviewer will consider whether the process is open and transparent and whether discussions are based on sound scientific principles. He or she will observe the process by which the panel assigns, deliberates, and concludes its obligations under the Workshop Terms of Reference. The appointed reviewer will report on observations, evaluations, and reviews specified in these Reviewer Terms of Reference and will recommend improvements. The peer report will appear in the final stock assessment report.

Guidelines: Guidelines for conducting a peer review of a data evaluation process have not been developed. Data Workshop guidelines are shown as Attachment 1.

Role of the Data Workshop Chair: The NMFS Project Contact is the SEDAR Coordinator and Data Workshop Chair. The appointed reviewer will be in full contact with the Workshop Chair before, during, and after the workshop, for consultation and guidance. The reviewer may communicate with data panelists, but only through the Chair or with the Chair's awareness.

Additional Roles: All rolls of the peer reviewer are delineated in this SoW. The reviewer shall not discuss his or her observations or findings with Data Workshop panel members prior to release of the Data Workshop Report or the Reviewer's Independent CIE Peer Review Report.

Contract Deliverables - Independent CIE Peer Review Reports: Each CIE reviewer shall complete an independent peer review report in accordance with the SoW. Each CIE reviewer shall complete the independent peer review according to required format and content as described in Annex 1. Each CIE reviewer shall complete the independent peer review addressing each ToR as described in Annex 2.

Other Tasks: All recognized tasks expected of the peer reviewer are delineated in this SoW. Fulfillment of other tasks identified by the reviewer as needed to meet the obligations of this SoW, though not specified in this SoW, are the responsibility of the reviewer. The reviewer may consult with the Chair on such matters.

Specific Tasks for CIE Reviewers: The following chronological list of tasks shall be completed by the CIE reviewer in a timely manner as specified in the **Schedule of Milestones and Deliverables**.

- 1) Conduct necessary pre-review preparations, including the review of background material and reports provided by the NMFS Project Contact in advance of the peer review.
- 2) Participate during the data workshop in Charleston, SC during 24-28 May 2010.
- 3) In Charleston, SC during 24-28 May 2010, as specified herein, conduct an independent peer review in accordance with the Reviewer ToRs (**Annex 2**).
- 4) No later than 11 June 2010, the CIE reviewer shall submit an independent peer review report addressed to the "Center for Independent Experts," and sent to Mr. Manoj Shivilani, CIE Lead Coordinator, via email to shivlanim@bellsouth.net, and Dr. David Sampson, CIE Regional Coordinator, via email to david.sampson@oregonstate.edu. The CIE report shall be written using the format and content requirements specified in Annex 1, and address each ToR in **Annex 2**.

Schedule of Milestones and Deliverables: CIE shall complete the tasks and deliverables described in this SoW in accordance with the following schedule.

21 April 2010	CIE sends reviewer contact information to the COTR, who then sends this to the NMFS Project Contact
10 May 2010	NMFS Project Contact sends the CIE Reviewer the pre-review documents
24-28 May 2010	The reviewer participates and conducts an independent peer review during the data workshop and calls
11 June 2010	CIE reviewer submits draft CIE independent peer review report to the CIE Lead Coordinator and CIE Regional Coordinator
25 June 2010	CIE submits CIE independent peer review report to the COTR
2 July 2010	The COTR distributes the final CIE report to the NMFS Project Contact and regional Center Director

Modifications to the Statement of Work: Requests to modify this SoW must be approved by the Contracting Officer at least 15 working days prior to making any permanent substitutions. The Contracting Officer will notify the COTR within 10 working days after receipt of all required information of the decision on substitutions. The COTR can approve changes to the milestone dates, list of pre-review documents, and ToRs within the SoW as long as the role and ability of the CIE reviewer to complete the deliverable in accordance with the SoW is not adversely impacted. The SoW and ToRs shall not be changed once the peer review has begun.

Acceptance of Deliverables: Upon review and acceptance of the CIE independent peer review report by the CIE Lead Coordinator, Regional Coordinator, and Steering Committee, the report shall be sent to the COTR for final approval as the contract deliverable based on compliance with the SoW and Reviewer ToRs. As specified in the Schedule of Milestones and Deliverables, the CIE shall send via e-mail the contract deliverable (CIE independent peer review report) to the COTR (William Michaels, via William.Michaels@noaa.gov).

Applicable Performance Standards: The contract is successfully completed when the COTR provides final approval of the contract deliverable. The acceptance of the contract deliverable shall be based on three performance standards:

- (1) the CIE report shall be completed with the format and content in accordance with **Annex 1**,
- (2) the CIE report shall address each ToR as specified in **Annex 2**,
- (3) the CIE report shall be delivered in a timely manner as specified in the schedule of milestones and deliverables.

Distribution of Approved Deliverables: Upon acceptance by the COTR, the CIE Lead Coordinator shall send via e-mail the final CIE report in *.PDF format to the COTR. The COTR will distribute the CIE report to the NMFS Project Contact and Center Director.

Support Personnel:

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Key Personnel:

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Annex 1: Format and Contents of CIE Independent Peer Review Report

1. The CIE independent report shall be prefaced with an Executive Summary providing a concise summary of the findings and recommendations, and specify whether the science reviewed is the best scientific information available.
2. The main body of the reviewer report shall consist of a Background, Description of the Individual Reviewer's Role in the Review Activities, Summary of Findings for each Reviewer ToR in which the weaknesses and strengths are described, and Conclusions and Recommendations in accordance with the ToRs.
 - a. Reviewers should describe in their own words the review activities completed during the panel review meeting, including providing a brief summary of findings, of the science, conclusions, and recommendations.
 - b. Reviewers should discuss their independent views on each ToR.
 - c. Reviewers should elaborate on any points that they feel might require further clarification.
 - d. Reviewers shall provide a critique of the NMFS data evaluation process, including suggestions for improvements of both process and products.
 - e. The CIE independent report shall be a stand-alone document for others to understand the weaknesses and strengths of the science reviewed, regardless of whether or not they read the associated data workshop report. The CIE independent report shall be an independent peer review of each ToR that shall include the reviewer's findings and views on each ToR, and not simply contain contents of the summary report.
3. The reviewer report shall include the following appendices:
 - Appendix 1: Bibliography of materials provided for review
 - Appendix 2: A copy of the CIE Statement of Work
 - Appendix 3: Pertinent information from the data workshop.

Annex 2: Terms of Reference for the Peer Review

SEDAR 24. South Atlantic Red Snapper Data Evaluation Review

Terms of Reference for the CIE Review of the SEDAR 24 Data Evaluation Process

1. Prior to the SEDAR 24 Data Evaluation Workshop (Workshop), become familiar with the Workshop Terms of Reference, data workbook, working papers, reference documents, and products of ad hoc working groups compiled for consideration during the Workshop.
2. Attend, if scheduling permits, at least two conference calls or webinars conducted by organized workgroups or ad hoc working groups. Observe the process with attention given to openness, transparency, thoroughness, and adherence to sound scientific principles
3. Attend the Workshop and observe the proceedings, including the plenary sessions and meetings of each of four organized workgroups during breakout sessions.
4. Evaluate the process by which the four workgroups receive, consider, and evaluate data made available to them. Comment on the process and nature of the discussions, considering, for example, whether the process is open and transparent and whether discussions are complete and based on sound scientific principles.
5. Observe the process by which the full Workshop panel receives presentations from its organized workgroups and ad hoc working groups. Review the process by which deliberations lead to panel decisions and recommendations on use of data sets to be forwarded to the analytical team for use in the stock assessment, with attention given to openness, transparency, thoroughness, and adherence to sound scientific principles.
6. Review the process by which the Workshop panel assigns, deliberates, and concludes its obligations under the Workshop Terms of Reference.
7. Prepare a written report detailing your observations, evaluations, and reviews specified in these Terms of Reference. Offer recommendations toward improvement of the procedures employed during the SEDAR data evaluation process.

Annex 3: Tentative Agenda

SEDAR 24 Red Snapper Data Evaluation Process Peer Review Data Workshop Daily Schedule Charleston, SC during 24-28 May 2010

Workshop Location

Francis Marion Hotel, 387 King Street, Charleston, SC 29403

Workshop Duration

Monday May 24 beginning at 1:00pm until Friday May 28, with adjournment at noon

General Daily Schedule

Mornings (Tu-F)	Session I - 8:00- 9:30	Session II - 10:00-12:00
Afternoons (M-Th)	Session I - 1:00- 3:00	Session II - 3:30- 5:30

This schedule is tentative and provides the general sequence of events. Session start times and end times will be followed to the extent possible. Timing of plenary sessions, workgroup sessions, and discussions topics will be driven by progress.

Workshop Goals - In response to the Data Workshop Terms of Reference the panel will:

- 1) compile life history information, abundance indices, & catch statistics;
- 2) evaluate and critique available datasets;
- 3) critique submitted working papers;
- 4) develop recommendations for data use for assessment analyses;
- 5) produce a spreadsheet of data for assessment modeling;
- 6) develop research recommendations; and
- 7) prepare a first draft of the Data Workshop report

Daily Overview

The following tasks are to be completed during workgroup and plenary sessions. Generally workgroups will develop, compile, and qualify materials for the assessment and will draft Data Workshop (DW) report components and replies to Terms of Reference (ToR). The full panel in plenary sessions will confirm tasks assigned to workgroups and will receive workgroup progress reports to discuss and adopt workgroup products throughout the week.

Monday May 24

Plenary

- 1) DW participants will introduce themselves.
- 2) Coordinator gives an overview of the general SEDAR process and DW specifics.
- 3) Coordinator explains the SEDAR FTP site as the workshop server.
- 4) Data Compiler explains the data workbook process and goals.
- 5) Panel reviews, may amend, and approves this daily overview as workshop guidance.
- 6) Workgroup leaders make initial reports and requests.
- 7) Coordinator introduces DW Report format and assignments.
- 8) Panel will review ToR and confirm assignments to workgroups as per SAR outline.
- 9) Panel assigns reference documents to workgroups for information and working papers for critique, led by Coordinator.

Workgroups 1) Discuss each assigned ToR, and assign member writing responsibilities for replies.

- 2) Leaders lead reviews of reference documents as needed.
- 3) Leaders assign each working paper for individual critique and written statement of applicability.
- 4) Begin to develop, compile, and qualify each available data set and to identify and discuss data issues.

Plenary

- 1) Chair of ad hoc working group on Discards presents summary and written findings.
- 2) Panel discusses applications of findings to the DW.
- 3) Chair of ad hoc working group on Historic (pre-MRFSS) Recreational Data presents summary and written findings.

- 4) Panel discusses applications of findings to the DW.

Homework

- 1) Plan your TOR writing assignments.
- 2) Review reference documents as need.
- 3) Critique assigned working papers.
- 4) Work on other individual assignments made by workgroup leaders.

Tuesday May 25

Workgroups

- 1) Discuss applicability of reference documents.
- 2) Accept or reject each working paper and draft a statement for plenary session.
- 3) Discuss findings of the two ad hoc working groups, as applicable.
- 4) Continue to develop, compile, and qualify data sets. Continue to identify, discuss, and resolve data issues. Accept or reject each data set for analytic use. Draft statement of discussion, issues, and anticipated use of each data set for DW report.
- 5) Develop recommendations on use or rejection of each data set. Begin drafts for plenary discussion.
- 6) Develop recommendations on research needs to improve future assessments.
- 7) Continue to discuss assigned TORs and draft replies.
- 8) Assign individual writing tasks on all DW report components. Prepare draft and final components as progress allows.
- 9) Identify items requiring post-DW effort.

Plenary

- 1) Receive critiques on working papers; confirm for analytic use and DW report.
- 2) Workgroup leaders lead discussions on initial list of data sets, applicability of *ad hoc* group findings, decisions to be made, task assignments, and known data issues.

Homework

- 1) Work on TOR and DW report component drafting assignments.
- 2) Work on other individual assignments made by workgroup leaders.

Wednesday May 26

Workgroups

- 1) Continue to develop, compile, and qualify data sets. Identify, discuss, and resolve data issues. Accept or reject each data set for analytic use. Draft statement of discussion, issues, and anticipated use of each data set for plenary discussion and DW report. Note unresolved issues to include in post-DW task list.
- 2) Finalize recommendations on each data set.
- 3) Continue to discuss assigned TORs and replies.
- 4) Continue to develop research recommendations.
- 5) Continue to prepare draft and final DW report components as progress allows.
- 6) Identify items requiring post-DW effort.

Plenary

- 1) Receive and discuss workgroup reports on data including status of data issues. Finalize and document data use decisions. Advance data sets to Data Compiler.
- 2) Receive data recommendations of workgroups. Discuss and adopt or reject each as a workshop recommendation. Document the recommendations.

Homework

- 1) Work on TOR and DW report component drafting assignments.
- 2) Work on other individual assignments made by workgroup leaders.

Thursday May 27

Workgroups

- 1) Complete discussion on TORs, and finalize replies for plenary sessions.
- 2) Continue to compile and document each data set. Finalize for plenary discussion.
- 3) Continue to prepare draft and final DW report components as progress allows.
- 4) Complete development of research recommendations. Prepare drafts for plenary.
- 5) Prepare post-DW task list including unresolved issues. Make individual assignments to complete post-DW tasks.

Plenary

- 1) Finalize datasets and documentation text for DW report including unresolved issues.

- 2) Receive data recommendations of workgroups. Discuss and adopt or reject each as workshop consensus recommendation. Finalize written data recommendations. Advance data sets to Data Compiler.
- 3) Review and critique workgroup drafts of replies to ToR and other DW report components.

Homework

- 1) Review DW report components and recommendations distributed during plenary.
- 2) Work on DW report component drafting and other workshop assignments.

Friday May 28

Workgroups

- 1) Ensure workgroup report components are up-to-date and on workshop server.
- 2) Ensure datasets approved for model use are complete and available in the data workbook.
- 3) Finalize workgroup research recommendations for review and approval in plenary.
- 4) Ensure post-DW task list entries are prepared for plenary action.

Plenary

- 1) Receive workgroup research recommendations. Discuss and adopt or reject each as a DW recommendation. Finalize text for DW report.
- 2) Conduct final review of DW report components and identify unfinished writing assignments for post-DW task list.
- 3) Receive workgroup reports of post-DW assignments. Compile items and adopt post-DW task list.

Homework

- 1) Drive safely
- 2) Review DW report sections and offer comments to authors.
- 3) Perform tasks on post-DW task list.
- 4) Comply with remainder of the SEDAR 24 Project Schedule, as applicable.

APPENDIX 3

PERTINENT INFORMATION FROM THE DATA WORKSHOP

SEDAR 24. South Atlantic Red Snapper

FINAL Terms of Reference

March 5, 2010

Data Workshop Terms of Reference

1. Review stock structure and unit stock definitions and consider whether changes are required.
2. Review, discuss, and tabulate available life history information (e.g., age, growth, natural mortality, reproductive characteristics); provide appropriate models to describe growth, maturation, and fecundity by age, sex, or length as applicable. Evaluate the adequacy of available life-history information for conducting stock assessments and recommend life history information for use in population modeling. Provide a written description of the biological sampling programs.
3. Compare and contrast life history parameter recommendations between the Gulf and South Atlantic populations of red snapper, and consider whether greater consistency between assessments of Gulf and South Atlantic stocks is appropriate.
4. Evaluate expanded otolith sampling efforts conducted during 2009 and consider which samples are appropriate as indicators of fishery and population age structure. Consider whether revisions of growth models are justified based on these additional samples.
5. Review available research and published literature on discard mortality rates, considering efforts for red snapper and similar species from the Atlantic as well as other areas such as the Gulf of Mexico, and considering recommendations on discard mortality provided through SEDAR 7 (Gulf of Mexico Red Snapper). Provide estimates of discard mortality rates by fishery, gear type, depth, and other feasible strata. Include thorough rationale for recommended discard mortality rates. Provide justification for any recommendations that deviate from the range of discard mortality provided in available research and published literature.
6. Provide measures of population abundance that are appropriate for stock assessment. Consider and discuss all available and relevant fishery dependent and independent data sources. Document all programs evaluated, addressing program objectives, methods, coverage, sampling intensity, and other relevant characteristics. Provide maps of survey coverage. Develop CPUE and index values by appropriate strata (e.g., age, size, area, and fishery); provide measures of precision and accuracy. Evaluate the degree to which available indices adequately represent fishery and population conditions. Recommend which data sources are considered adequate and reliable for use in assessment modeling.
7. Review the application of pre-MRFSS recreational catch records in the SEDAR 15 benchmark assessment and recommend appropriate use of pre-MRFSS data for assessment of red snapper.
8. Characterize commercial and recreational catch, including both landings and discards in both pounds and number. Evaluate and discuss the adequacy of available data for accurately characterizing harvest and discard by species and fishery sector. Provide observed length and age distributions if feasible. Provide maps of fishery effort and harvest. Provide a written description of the discard sampling programs.

9. Review SEDAR 15 and SEDAR 7 approaches to selectivity of red snapper, post-SEDAR 15 evaluations of fishery selectivity patterns for Atlantic red snapper, and available length and age composition information to develop recommendations for addressing fishery selectivity in the assessment model. Specifically address the degree to which domed shape selectivity should be applied to hook and line fisheries.
10. Provide recommendations for future research in areas such as sampling, fishery monitoring, and stock assessment. Include specific guidance on sampling intensity (number of samples including age and length structures) and appropriate strata and coverage.
11. Develop a spreadsheet of assessment model input data that reflects the decisions and recommendations of the Data Workshop. Review and approve the contents of the input spreadsheet by June 4.
12. No later than June 18, 2010, prepare the Data Workshop report providing complete documentation of workshop actions and decisions (Section II. of the SEDAR assessment report). Develop a list of tasks to be completed following the workshop

APPENDIX 4

SEDAR PROCESS OVERVIEW (extracted from SEDAR 15 SAR 1)

SEDAR (Southeast Data, Assessment and Review) was initially developed by the Southeast Fisheries Science Center and the South Atlantic Fishery Management Council to improve the quality and reliability of stock assessments and to ensure a robust and independent peer review of stock assessment products. SEDAR was expanded in 2003 to address the assessment needs of all three Fishery Management Council in the Southeast Region (South Atlantic, Gulf of Mexico, and Caribbean) and to provide a platform for reviewing assessments developed through the Atlantic and Gulf States Marine Fisheries Commissions and state agencies within the southeast.

SEDAR strives to improve the quality of assessment advice provided for managing fisheries resources in the Southeast US by increasing and expanding participation in the assessment process, ensuring the assessment process is transparent and open, and providing a robust and independent review of assessment products. SEDAR is overseen by a Steering Committee composed of NOAA Fisheries representatives: Southeast Fisheries Science Center Director and the Southeast Regional Administrator; Regional Council representatives: the Executive Directors and Chairs of the South Atlantic, Gulf of Mexico, and Caribbean Fishery States and Gulf States Marine Fisheries Commissions.

SEDAR is organized around three workshops. First is the Data Workshop, during which fisheries, monitoring, and life history data are reviewed and compiled. Second is the Assessment workshop, during which assessment models are developed and population parameters are estimated using the information provided from the Data Workshop. Third and final is the Review Workshop, during which independent experts review the input data, assessment methods, and assessment products.

SEDAR workshops are organized by SEDAR staff and the lead Council. Data and Assessment Workshops are chaired by the SEDAR coordinator. Participants are drawn from state and federal agencies, non-government organizations, Council members, Council advisors, and the fishing industry with a goal of including a broad range of disciplines and perspectives. All participants are expected to contribute to the process by preparing working papers, contributing, providing assessment analyses, and completing the workshop report. SEDAR Review Workshop Panels consist of a chair, a reviewer appointed by the Council, and 3 reviewers appointed by the Center for Independent Experts (CIE), an independent organization that provides independent, expert reviews of stock assessments and related work. The Review Workshop Chair is appointed by the SEFSC director and is usually selected from a NOAA Fisheries regional science center. Participating councils may appoint representatives of their SSC, Advisory, and other panels as observers to the review workshop.